



**NTSB** National Transportation Safety Board

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*Office of Highway Safety*

# **Vehicle Crashworthiness and Occupant Protection**

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# Survival Factors Issues

- Occupant protection
- Roof strength
- Advanced window glazing
- Luggage rack securement



# Exterior Deformation

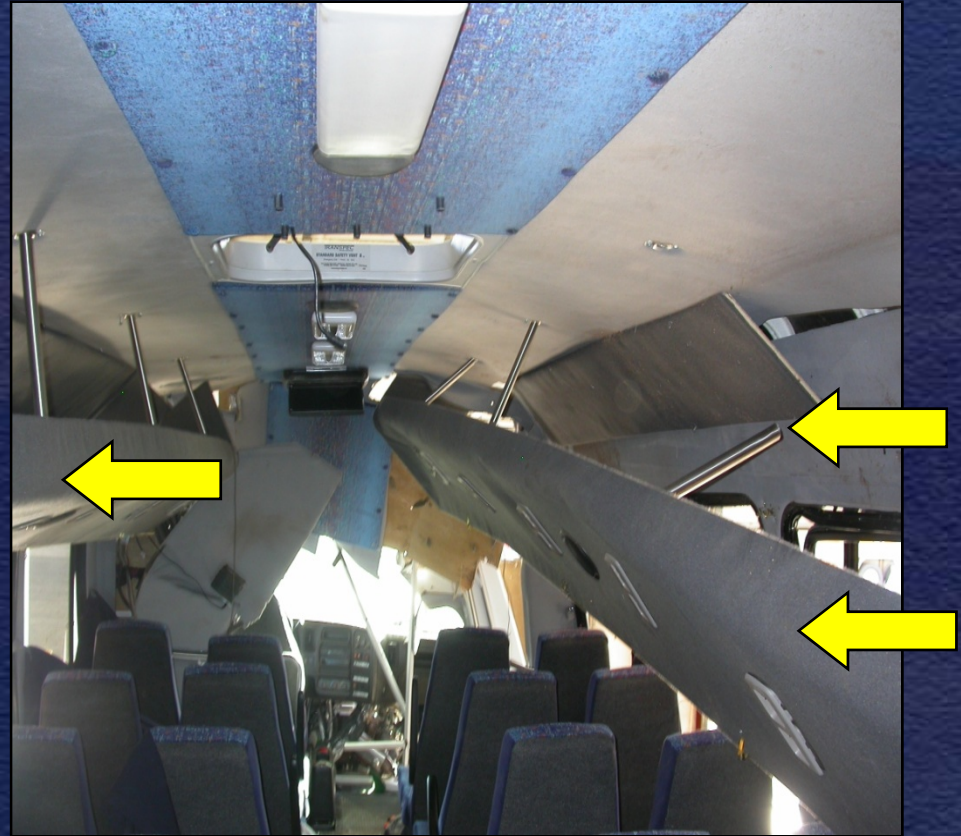
- Front fenders, hood, skirts, front roof, loading door
- 9 of 10 windows broken
- Minimal roof damage





# Interior Damage

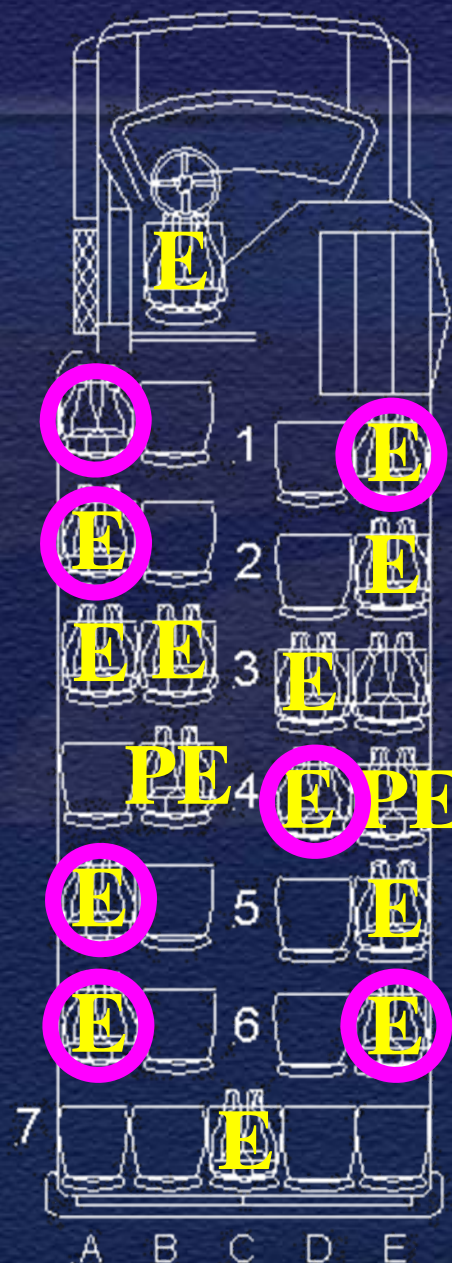
- No seat deformation
- Luggage racks
  - Detachments
  - Evidence of contact
  - No standards





# Injuries

- 17 Occupants
  - Driver
  - 16 passengers
  - Aged 8-62 years
- 15 Ejections
- 7 Fatalities
  - 6 were ejected
- Total:
  - 7 fatal, 7 serious, 3 minor





# Crashworthiness

No standards for:

- Occupant protection (other than driver)
- Roof strength
- Advanced glazing



# Crashworthiness

- No seat belts for passenger seats
- Driver's seat equipped with lap/shoulder belt



# Crashworthiness





# Crashworthiness

- Lake Placid, Florida





# Motorcoach Safety Action Plan

## U.S. Department of Transportation Motorcoach Safety Action Plan





# Summary

- No standards for occupant protection, roof strength, advanced window glazing, and luggage rack securement on medium-size buses
- Include buses above 10,000 lbs in rulemaking that addresses occupant protection, roof strength, window glazing, and luggage rack performance



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